

Customer No.: 31561
Docket No.: 10545-US-PA
Application No.: 10/708,664

To the Claims:

Claim 1. (currently amended) An under bump metallurgy layer, between a bonding pad of a chip and a bump, for improving adhesion between the bonding pad and the bump, comprising:

an adhesion layer, disposed on the bonding pad;

a barrier layer, disposed on the adhesion layer; and

a wetting-barrier layer, disposed on the barrier layer and between the barrier layer and the bump, wherein the wetting-barrier layer is a nickel post and directly contacts on the bump~~[[a material of the wetting-barrier layer is specifically defined as a nickel]]~~ while the bump comprises tin material and the bump is disposed on the wetting-barrier layer and the wetting-barrier layer ~~only~~ covers an upper surface of the barrier layer.

Claim 2. (original) The under bump metallurgy layer of claim 1, wherein a material of the adhesion layer is selected from the following group consisting of titanium (Ti), titanium-tungsten (Ti-W) alloy, chromium (Cr), titanium nitride (TiN), tantalum nitride (TaN), tantalum (Ta), aluminum (Al) and copper (Cu).

Claim 3. (previously presented) The under bump metallurgy layer of claim 1, wherein a material of the adhesion layer is selected from the following group consisting of titanium, titanium-tungsten alloy, chromium, titanium nitride, tantalum nitride, tantalum and aluminum, and the bonding pad is made of aluminum.

Claim 4. (previously presented) The under bump metallurgy layer of claim 1, wherein a material of the adhesion layer is selected from the following group consisting of

Customer No.: 31561
Docket No.: 10545-US-PA
Application No.: 10/708,664

titanium, titanium-tungsten alloy, chromium, titanium nitride, tantalum nitride, tantalum and copper, and the bonding pad is made of copper.

Claim 5. (original) The under bump metallurgy layer of claim 1, wherein a material of the barrier layer comprises nickel-vanadium alloy.

Claim 6. (original) The under bump metallurgy layer of claim 1, wherein the under bump metallurgy layer further comprises an anti-oxidation layer and the anti-oxidation layer is disposed between the wetting-barrier layer and the bump.

Claim 7. Cancelled.

Claim 8. (currently amended) A flip chip structure, comprising:

a chip having an active surface, a passivation layer and a plurality of bonding pads, wherein the bonding pads are disposed on the active surface and the passivation layer are disposed on the active surface exposing the bonding pads;

an under bump metallurgy layer, wherein the under bump metallurgy layer comprising:

an adhesion layer, disposed on the bonding pad;

a barrier layer, disposed on the adhesion layer; and

a wetting-barrier layer, disposed on the barrier layer, wherein the wetting-barrier layer is a nickel post~~[[a material of the wetting-barrier layer is specifically defined as a nickel]]~~ and wherein the wetting-barrier layer covers an upper surface of the barrier layer;

Customer No.: 31561
Docket No.: 10545-US-PA
Application No.: 10/708,664

and

a bump, disposed on the wetting barrier layer with direct contact.

Claim 9. (original) The flip chip structure of claim 8, wherein a material of the adhesion layer is selected from the following group consisting of titanium (Ti), titanium-tungsten (Ti-W) alloy, chromium (Cr), titanium nitride (TiN), tantalum nitride (Ta₂N₅), tantalum (Ta), aluminum (Al) and copper (Cu).

Claim 10. (previously presented) The flip chip structure of claim 8, wherein a material of the adhesion layer is selected from the following group consisting of titanium, titanium-tungsten alloy, chromium, titanium nitride, tantalum nitride, tantalum and aluminum, and the bonding pad is made of aluminum.

Claim 11. (previously presented) The flip chip structure of claim 8, wherein a material of the adhesion layer is selected from the following group consisting of titanium, titanium-tungsten alloy, chromium, titanium nitride, tantalum nitride, tantalum and copper, and the bonding pad is made of copper.

Claim 12. (original) The flip chip structure of claim 8, wherein a material of the barrier layer comprises nickel-vanadium alloy.

Claim 13. (original) The flip chip structure of claim 8, wherein the under bump metallurgy layer further comprises an anti-oxidation layer and the anti-oxidation layer is disposed between the wetting-barrier layer and the bump.

Claim 14. Cancelled.

Customer No.: 31561
Docket No.: 10545-US-PA
Application No.: 10/708,664

Claim 15. (original) The flip chip structure of claim 8, wherein a material of the bump is made of tin-silver-copper alloy.

Claim 16. (original) The flip chip structure of claim 8, wherein a material of the bump is made of tin-copper alloy.

Claim 17. (previously presented) The flip chip structure of claim 8, wherein a material of the bump is tin.

Claims 18-21. Cancelled.

Claim 22. (previously presented) The under bump metallurgy layer of claim 1, wherein the wetting-barrier layer is within the barrier layer to cover the upper surface thereon.

Claim 23. (previously presented) The under bump metallurgy layer of claim 8, wherein the wetting-barrier layer is within the barrier layer to cover the upper surface thereon.